

Background . Perchlorate is a widely occurring contaminant. At sufficiently high doses, perchlorate competitively inhibits iodide uptake and thus thyroid hormone production. The health effects of chronic low dose perchlorate exposure on healthy individuals are largely unknown.

Objectives. We undertook a community-based epidemiologic study to compare thyroid function and disease in women with differing likelihoods of prior and current perchlorate exposure.

Methods. Residential blocks were randomly selected from areas: 1) in the drinking water plume with potential perchlorate exposure; 2) with potential exposure to airborne environmental contaminants; and 3) neighboring but without such known exposures. Eligible women had lived in the area for ≥ 6 months and were aged 20-50 years during 1988-1996 (during documented drinking water well contamination). We interviewed 814 women and collected blood samples (assayed for thyroid stimulating hormone [TSH] and free thyroxine [fT4]) from 431 interviewed women. Daily urine samples were collected, pooled, and assayed for perchlorate and iodide for 178 interviewed premenopausal women who provided blood samples. We performed multivariate regression analyses comparing thyroid function and disease by residential area and modeled urinary perchlorate dose in relation to TSH, fT4, and thyroid disease adjusted for urinary iodide levels.

Results Residential location and computed current perchlorate dose were not associated with thyroid function or thyroid disease. Computed perchlorate dose did not exceed reference dose in any participants.

Conclusions. No persistent effect of perchlorate on thyroid function or disease was found several years after contaminated wells were capped.